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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,416	11/24/2003	H. Ernest Romine	96/021A	5666

7590 05/20/2004

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EXAMINER
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ARNOLD JR, JAMES

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/720,416	<b>Applicant(s)</b> ROMINE ET AL.	
	<b>Examiner</b> James Arnold, Jr.	<b>Art Unit</b> 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6 and 8 is/are allowed.
- 6) ☒ Claim(s) 7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>24 November 2003</u> . | 6) <input type="checkbox"/> Other: _____  |

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gomi et al. (USPN 4,477,334).

The Gomi reference discloses an aromatic hydrocarbon having 61% by weight of aromatic carbons; thermally cracking aromatic hydrocarbons at a temperature between 450 and 500 C and a pressure of up to 20 Kg/cm<sup>2</sup>G (285 psig); and fractionating said thermally cracked aromatics to obtain light and heavy distillates boiling above and below 370 C. See Table 1; Column 4, lines 47-68; and Column 2, lines 35-68.

The reference does not disclose thermally cracking aromatic hydrocarbons for a time sufficient to increase the carbon content to greater than 80%.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to thermally crack aromatic hydrocarbons for a time sufficient to increase the carbon content to greater than 80% because in a cracking process larger hydrocarbons are broken down into numerous smaller molecules and it would be appropriate to continue this process for a time necessary to achieve the desired percentage of carbon content.

***Allowable Subject Matter***

Claims 1-6 and 8 are allowable. The following is an examiner's statement of reasons for allowance: The prior art does not disclose a process for producing high melting mesogens, said process comprising: combining a first aromatic carbon solvent system having boiling points in the atmospheric equivalent boiling point (AEBP) range of about 285 degrees to about 500 degrees C., at least 80% of the carbon atoms of said hydrocarbons are aromatic as characterized by carbon 13 NMR and said aromatic hydrocarbons are selected from the group consisting of (i) aromatic compounds and N, O and S heteroaromatic compounds having 2 to 5 rings, (ii) substituted aromatic compounds and N, O and S heteroaromatic compounds having 2 to 5 rings wherein said substituents are alkyl groups having 1 to 3 carbons (C.sub.1 to C.sub.3), (iii) hydroaromatic compounds and N, O and S heterohydroaromatic compounds having 2 to 5 rings, (iv) substituted hydroaromatic compounds and N, O and S heterohydroaromatic compounds having 2 to 5 rings wherein said substituents are alkyl groups having 1 to 3 carbons (C.sub.1 to C.sub.3), and (v) mixtures thereof with a second solvent system having a solubility parameter in the range of 8 to 11.5, the ratio of said first solvent system to said second solvent system ranging from 1:20 to 2:5 to form an extraction solution; adding said extraction solution to a pitch in a solution to pitch ratio ranging from about 3:1 to about 20:1; and extracting said pitch with said

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extraction solution to yield a residue of mesogens, said mesogens melting at or above a temperature of 375.degree. C. The prior art does not disclose a solvated mesophase pitch which comprises: mesogens; and 5 to 40% of a solvating component comprising a mixture of aromatic hydrocarbons having boiling points in the atmospheric equivalent boiling point (AEBP) range of about 285degrees to about 500degrees C., at least 80% of the carbon atoms of said hydrocarbons are aromatic as characterized by carbon 13 NMR and said aromatic hydrocarbons are selected from the group consisting of (i) aromatic compounds and N, O and S heteroaromatic compounds having 2 to 5 rings, (ii) substituted aromatic compounds and N, O and S heteroaromatic compounds having 2 to 5 rings wherein said substituents are alkyl groups having 1 to 3 carbons (C.sub.1 to C.sub.3), (iii) hydroaromatic compounds and N, O and S heterohydroaromatic compounds having 2 to 5 rings, (iv) substituted hydroaromatic compounds and N, O and S heterohydroaromatic compounds having 2 to 5 rings wherein said substituents are alkyl groups having 1 to 3 carbons (C.sub.1 to C.sub.3), and (v) mixtures thereof. Finally, the prior art does not disclose a green fiber comprising a solvated mesophase pitch having a diameter of less than 13 microns.

### ***Conclusion***

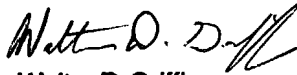
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Arnold, Jr. whose telephone number is 571-272-1443. The examiner can normally be reached on Monday-Thursday 8:30 AM-6:00 PM; Fridays from 8:30 AM-5:00 PM with alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ja  
May 17, 2004

  
**Walter D. Griffin**  
**Primary Examiner**